

State Water Project Incidental Take Permit Risk Assessment for Delta Smelt and Longfin Smelt

Section 1: Overview

Date: 11/29/2022

Life Stages Present:

Delta Smelt (DS): Sub-adults and Adults

Longfin Smelt (LFS): Sub-adults and Adults

Advice to Water Operations Management Team (WOMT):

No Advice.

Risk Assessment:

Delta Smelt: Based on distribution patterns over the past decade and low detections in this water year, Delta Smelt are unlikely to be prevalent in the Central and South Delta. Limited detection data from the past month and the position of X2 in the Sacramento River support Delta Smelt presence in the lower Sacramento River. The last Delta Smelt observations were on November 3 & 7, 2022, in the lower Sacramento River. These detections may be an indication that DS are starting to stage downstream of X2 in preparation for seasonal migration into freshwater. The likelihood of Delta Smelt subadult entrainment is low due to seasonal timing. The Integrated Early Winter Pulse Protection (IEWPP) period begins on December 1, 2022. Precipitation of up to 1 inch in the Delta is anticipated beginning Wednesday night through Thursday night (11/30-12/1). The predicted amount of precipitation is unlikely to cause “First Flush” conditions and trigger IEWPP regulations.

Longfin Smelt: No adult LFS have been detected in Enhanced Delta Smelt Monitoring (EDSM) in the Central or South Delta in recent sampling. LFS adults are expected to move into spawning habitat by November and December, and water temperatures are now suitable for spawning. Adult and sub-adult LFS have been detected by EDSM in Suisun Marsh and Suisun Bay (Table 1). One adult was detected by EDSM in Broad Slough near the confluence on 11/21/2022. In November, Chipps Island Trawl detected three adult and six sub-adult LFS. Based on distribution data and life history, adults and sub-adults are not expected to be prevalent in the Central or South Delta and therefore are expected to be at low risk of entrainment. Regulations for adult LFS protection go into effect 12/1/2022.

Section 1-A: Sacramento River and Confluence

Table 1: Risk of entrainment into the central Delta and export facilities for Delta Smelt in the Sacramento River and confluence:

Species and life stage	Risk type	Risk level	Rationale (turbidity, exports, OMR level, X2, Q west, temperature, distribution etc.)
DS larvae and juveniles	Exposure Risk (Hydrology)	NA	Spawning hasn't started, no larvae present.
DS subadults and adults	Routing Risk (Behavior and life history)	Low	Turbidity remains low, staging near X2 may be starting soon, water temperatures are declining.
DS	Overall Entrainment Risk	Low	Same as above.

Table 2: Risk of entrainment into the central Delta and export facilities for Longfin Smelt in the Sacramento River and confluence:

Species and life stage	Risk type	Risk level	Rationale (turbidity, exports, OMR level, X2, Q west, temperature, distribution etc.)
LFS larvae and juveniles	Exposure Risk (Hydrology)	NA	Conditions are now suitable for spawning, and spawning may have started, however no larvae or ripe adults have been detected yet (no sampling for larvae is occurring yet, sampling for larvae will begin 12/5).
LFS sub-adults and adults	Routing Risk (Behavior and life history)	Low	Conditions are now suitable for spawning, and spawning may have started. Staging downstream of X2 is continuing. Additionally, FCCL reported a mature male expressing milt was collected in the Lower Sacramento River near Sherman Island by the Broodstock Collection Effort.
LFS	Overall Entrainment Risk	Low	Same as above.

Section 1-B: Central Delta

Table 3: Risk of entrainment into the export facilities for Delta Smelt in the central Delta:

Species and life stage	Risk type	Risk level	Rationale (turbidity, exports, OMR level, X2, Q west, temperature, distribution etc.)
DS subadults and adults	Exposure Risk (Hydrology)	Low	No subadults or adults have been detected in the Central Delta in field surveys.

Table 4: Risk of entrainment into the export facilities for Longfin Smelt in the central Delta:

Species and life stage	Risk type	Risk level	Rationale (turbidity, exports, OMR level, X2, Q west, temperature, distribution etc.)
LFS sub-adults and adults	Exposure Risk (Hydrology)	Low	No subadults or adults have been detected in the Central Delta in field surveys.

- Change in exposure from previous week: *(Note: The change in risk compared to previous weeks is not required by the Incidental Take Permit [ITP]).*
 - DS: Risk remains low, though two fish were detected by EDSM in the lower Sacramento River in early November, indicating that staging may be starting soon.
 - LFS: Risk remains low, conditions are now suitable for spawning.
- Reporting Old and Middle River Index (OMRI) *(Number and range of OMRI bins will vary based on anticipated hydrology and operations)*
 - Relevant Conditions of Approval (COAs) are not active.

Section 2: Basis for Advice

The 2020 ITP ([Incidental Take Permit for Long-Term Operation of the State Water Project in the Sacramento-San Joaquin Delta 2081-2019-066-00](#)) states that advice to WOMT shall be based the following Conditions of Approval:

List relevant Condition of Approval number and title based on species/life stage, time of year, etc.

Discussion of Conditions of Approval

Provide discussion addressing criteria for each Condition of Approval listed in “Basis for Advice” section. Refer to data below where appropriate.

COAs relevant to OMR management go into effect December 1st. The Smelt Monitoring Team (SMT) conducted a Risk Assessment based on COA 8.1.5.2 and noted that there is no regulatory mechanism in place to provide advice until December 1st.

Section 3: Hydrology and Operations

Assessment of hydrologic, operational, and meteorological information. 8.1.5.2 A.

Section 3-A: Water operations conditions. 8.1.5.2.A. i

- Antecedent Actions: *(e.g. Delta Cross Channel [DCC] gate closure and actions such as integrated early winter pulse protection, etc.)*
 - DCC is closed as of 11/28/22.
 - OMR management has not been initiated.
- Controlling Factors: Water Quality

- Water Temperature:
 - Clifton Court Forebay (CCF) Daily Average Water Temperature = NA
 - 3 Station Average = 11.23°C
- Tidal Cycle: NA
- Turbidity:
 - 8.3.1 Freeport 3-day average = 1.67 formazin nephelometric units (FNU)
 - 8.5.1 Old River at Bacon Island (OBI) Turbidity = 1.79 FNU
- Salinity: X2 > 81 km, estimated at 99.1 km for Sacramento River as of 11/28/22, and 94.3 km for San Joaquin River as of 11/10/22.
- Hydrologic Footprint: No Particle Tracking Models were requested.

Section 3-B: Water operations outlook. 8.1.5.2.A. ii

- Outages
 - State Water Project (SWP): None
 - Central Valley Project (CVP): None
- Exports:
 - CCF: 300 to 1,000 cfs
 - Jones: 900 to 1,800 cfs
- Meteorological Forecast: Light showers possible in the mountains at start of week. Cool and dry weather with near freezing morning temperatures Tuesday and Wednesday. Widespread precipitation returns Wednesday night through the weekend.
- Storm Event Projection: NA

Section 3-C: Projected conditions. 8.1.5.2.A. iii

- DCC Gates position: Scheduled to remain closed for seasonal operation. Adjustments could be necessary to respond to real-time salinity conditions
- Sacramento River flow at Freeport: 6,078 cfs
- San Joaquin River flow at Vernalis: 601 cfs
- Qwest: 2,374 cfs as of 11/28/22, 100 cfs as of 11/29/22
- OBI Turbidity: 1.79 FNU
- NDOI: 4,237 cfs
- Upstream releases:
 - Keswick = 3,250 cfs. Anticipated Weekly Range of Releases: 3,250 cfs
 - Nimbus = 1,300 cfs. Anticipated Weekly Range of Releases: 1,300 cfs
 - Goodwin = 200 cfs. Anticipated Range of Weekly Releases: 200 cfs
 - Oroville = 1,400 cfs. Anticipated Weekly Range of Releases: 1,600 cfs to 950 cfs

Table 5: Comparison of OMR and OMR Index (5-day and 14-day averages for OMR Index and USGS gauge were reported on [SacPAS website](#), accessed 29 November 2022.

Date	Averaging Period	USGS gauges (cfs)	Index (cfs)
11/24/2022	Daily	-2,450	-1,670
11/24/2022	5-day	-2,9890	-2,070
11/24/2022	14-day	-2,780	-2,250

Section 4: Distribution and Biology.

8.1.5.2.B. Assessment of biological information for Delta Smelt and Longfin Smelt

Section 4-A: Delta Smelt population status 8.1.5.2.B. i

- EDSM: One subadult DS (Fork-length (FL): 55mm) and one adult DS (FL: 62mm) were detected in lower Sacramento River on November 3rd and 7th respectively.
- Fall Mid-water Trawl (FMWT) Index for Delta Smelt: October Index: 0
- Delta Smelt life cycle model (LCM) discussion: NA
- Biological Conditions: NA
- % of population in Delta zones: NA
- Smelt Larva Survey (SLS) or 20mm Survey: SLS sampling will begin 12/5/2022.
- Salvage: No DS have been salvaged at either facility this water year.

Section 4-B: Longfin Smelt population status 8.1.5.2.B. ii.

- FMWT Index: October Index = 261
- Other Surveys:
 - EDSM: six sub-adult LFS (FL: 62-74mm) and two adult LFS (FL: 96-102mm) were detected in Suisun Marsh and Suisun Bay during the week of November 21st to November 25th (Table 1). One of the adult LFS (FL: 96mm) was detected in Broad Slough near the Confluence on November 21st.
 - Chipps Island Trawl: Five sub-adult LFS (60-72mm) three adult LFS (FL: 89-95mm) were detected during the week of November 21st to November 25th (Table 2).
 - Bay Study: In September, 36 sub-adult LFS (20-84mm) were detected from south of Bay Bridge (station 110) to San Pablo Bay (station 322). Distribution shifted further upstream in October with 47 sub-adult LFS (FL: 20-84mm) and five adult LFS (FL: 86-97mm) detected from near the San Mateo Bridge (station 101) to the lower Sacramento River (station 750). In November, the center of distribution continued to move upstream from Central Bay to San Pablo and Suisun Bay with a total of 73 sub-adult LFS (FL: 20-84mm) and three adult LFS (FL: 87-89mm) detected.
 - FMWT: In November, 27 sub-adults LFS (FL: 55-74mm) and two adult LFS (FL: 95-100mm) were detected (Table 3). Two sub-adults were found in lower Sacramento

River (station 704-706) and one sub-adult was detected near Broad Slough near the Confluence (station 802).

- Salvage: No LFS have been salvaged at either facility this water year.

Section 4-C: Additional data sources to assess sensitivity to entrainment Delta.8.1.5.2.C & D. i

Notes:

- The first DS experimental release of this water year will occur 11/28-12/2.
- It is unlikely that the upcoming rain event will trigger the First Flush.

Attachments: Table 1: EDSM Catch Table, Table2: Chipps Island Trawl Catch Table, Table 3: FMWT Catch Table, and Figure 1: FMWT Station Location.

Table 1: DS and LFS catch for EDSM 2022 Phase 3 Kodiak trawls November 21st- November 25th. Only stations with catch of these species are reported here. FCCL = Fish Conservation and Culture Lab. These data are preliminary and subject to change.

Date	Stratum	Subregion	Station Code	Species	Mark Type	Fork Length (mm)	Total Catch	Disposition
11/21/2022	Suisun Bay	Mid Suisun Bay	23-17-SB02	LFS	None	73	1	Released
11/21/2022	Suisun Bay	Mid Suisun Bay	23-17-SB02	LFS	None	68	1	Released
11/21/2022	Suisun Bay	Confluence	23-17-SB04	LFS	None	96	1	FCCL
11/22/2022	Suisun Bay	Mid Suisun Bay	23-17-SB05	LFS	None	74	1	Released
11/23/2022	Suisun Marsh	Suisun Marsh	23-17-SM03	LFS	None	102	1	FCCL
11/23/2022	Suisun Marsh	Suisun Marsh	23-17-SM03	LFS	None	59	1	Released
11/25/2022	Suisun Marsh	Grizzly Bay	23-17-SM06	LFS	None	62	1	Released
11/25/2022	Suisun Marsh	Suisun Marsh	23-17-SM07	LFS	None	74	1	Released

Table 2: LFS catch for Chipps Island Trawls November 21st – November 25th. These data are preliminary and subject to change.

Date	Station Code	Species	Mark Type	Fork Length (mm)	Total Catch	Disposition
11/21/2022	SB018N	LFS	None	92	1	FCCL
11/21/2022	SB018N	LFS	None	89	1	FCCL
11/22/2022	SB018M	LFS	None	63	1	n/a
11/22/2022	SB018M	LFS	None	72	1	n/a
11/22/2022	SB018M	LFS	None	95	1	FCCL
11/22/2022	SB018M	LFS	None	71	1	n/a
11/23/2022	SB018N	LFS	None	64	1	n/a
11/23/2022	SB018N	LFS	None	60	1	n/a

Table 3: FMWT November 2022 LFS catch table. These data are preliminary and subject to change.

Month	Station	Catch	Fork Length (mm)	Adjusted Length Frequency
November	802	1	66	1
November	706	1	63	1
November	704	1	74	1
November	603	1	63	1
November	515	2	63	1
November	515	2	57	1
November	513	1	70	1
November	512	1	95	1
November	511	1	72	1
November	510	2	64	1
November	510	2	63	1
November	509	5	67	1
November	509	5	63	1
November	509	5	59	2
November	509	5	56	1
November	503	1	66	1
November	418	1	100	1
November	417	1	65	1
November	415	1	55	1
November	411	1	64	1
November	336	1	62	1
November	329	1	56	1
November	328	1	60	1
November	323	1	60	1
November	315	4	72	1
November	315	4	68	1
November	315	4	67	1
November	315	4	59	1

FMWT Station Map

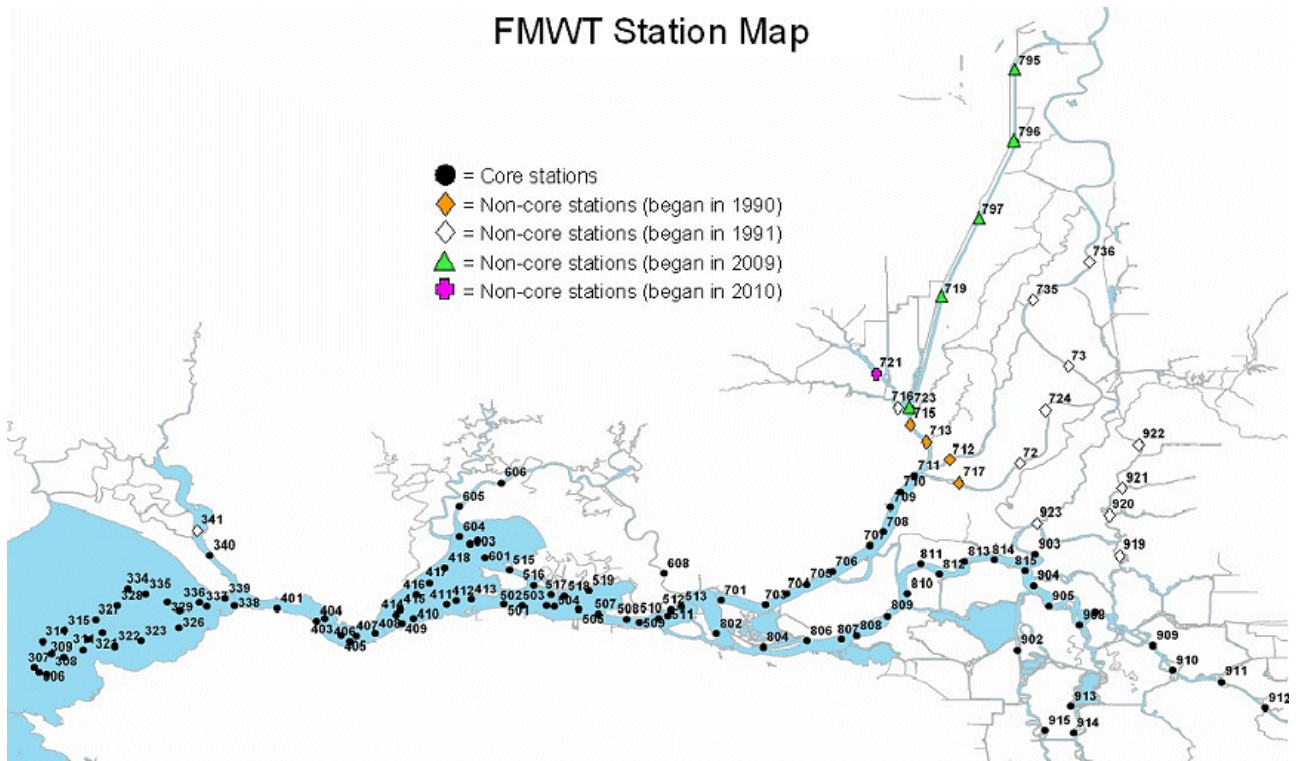


Figure 1: Map of FMWT sampling locations